

XVIII.—*Notes on Neotropical Mammals of the Genera Felis, Hapale, Oryzomys, Akodon, and Ctenomys, with Descriptions of new Species.* By OLDFIELD THOMAS.

#### THE SPOTTED TIGER-CATS OF BRAZIL.

AMONG his recent collections Mr. A. Robert has sent home a certain number of small spotted cats, these being animals very badly represented in most Museums, and with their literature and determinations in a great state of confusion.

Of this group Hensel distinguished three species in Rio Grande do Sul, viz. "*Felis macroura*, Wied," "*F. guigna*, Mol.," and a new species he named *F. guttula*. Mr. Robert obtained all these three, and, by the kindness of Dr. Matschie, skulls of his specimens have been directly compared with those of the Hensel collection in Berlin, so that there can be no doubt about their determinations.

At the same time it should be noted that specimens obtained together, and clearly conspecific, show an extraordinary amount of variation both in marking and skull-characters; so that the study of the group is beset with quite unusual difficulties.

The three types referred to may be briefly distinguished as follows:—

- I. Size larger. Fur soft and thick. Nape-hairs generally reversed forwards, at least in part. Skull broadly rounded, with a large smooth brain-case and short face.

To this type belong the Mexican and Central-American tiger-cats, *F. Wiedii*, Schinz (*F. macroura*, Wied), and many others, including *F. glaucula*, sp. n., described below. Cuvier's *F. mitis* would also probably come here, but being without locality is not certainly determinable and should be ignored. The same may be said of Lesson's *F. elegans* \*.

- II. Size rather smaller. Fur harsher. Nape-hairs not reversed. General colour darker. Skull long and narrow, somewhat resembling that of the *Jaguarondi*, with narrow brain-case and elongated face.

*F. guttula*, Hens.

- III. Size smallest. Fur medium or harsh. Nape-hairs not reversed. Skull small and delicate, with smooth brain-case and short face.

*F. pardinoides*, Gray (*F. guigna*, Mol., of Hensel).

\* Cent. Zool. p. 69, pl. xxi. (1830).

In addition the small-spotted *F. Geoffroyi*, with its little ally *F. salinarum*, sp. n., makes yet a fourth Neotropical section of the group; while a fifth appears to be formed by the true *F. tigrina*\*, judging by a small cat from Cayenne which may be assigned to that species, and is distinguished by its small size, bright colouring, and delicate skull; but it is in too imperfect a state for me to describe it more fully.

*Felis glaucula*, sp. n.

The Mexican representative of Group I. General characters as above described. Colour grey instead of fulvous or tawny.

Size about as in *F. Wiedii*. Fur fine and soft, rather short; hairs of back (April and May specimens) about 17 to 18 millim. Fur of nape reversed forwards, in some cases from behind the withers on to the crown. General ground-colour pale drab-grey, very different to the strong tawny of the South-American members of the group. Linear markings narrow, and on the sides enclosing elongate spaces so as to recall the pattern found in the ocelots. Lower cheek-line less developed than usual. Nape with two strongly defined and two less defined lines outside them, but all are very narrow, and in some cases, as in the type, the central pair are themselves longitudinally split by a pale line. Black markings of posterior back forming a double series of broken lines one to three inches in length on each side of the pale middle line. Laterally the markings take the form of rosettes, rounded on the shoulders and hips, obliquely elongate on the flanks; the bordering lines of these markings are deep black, sharply defined, and rarely more than about  $\frac{1}{4}$  inch in diameter. Central space of rosettes also grey, slightly darker than the general ground-colour. Under surface white, a prominent black line across below jaw, another less prominent across chest (in the type this latter is replaced by two lines of spots), and a number of round black spots on belly. Limbs buffy grey on outer, white on inner aspect, the spots continued down to the proximal part of the hands and feet. Tail marked with 11 or 12 black and buffy-white rings, the dark and the light about equally broad.

Skull in general shape like that of *F. Wiedii*, but more heavily ridged. Brain-case smaller, narrower, more constricted behind the postorbital processes, and more parallel-

\* Schr. Säug. pl. cvi. (1775). The publication of this plate antedates that of the text, and as it is a copy of Buffon's plate, the animal figured by the latter—which is from Cayenne—may be taken as its type.

sided, so that its breadth measured across its frontal region more nearly approaches that of its greatest parietal breadth. Upper profile of skull gently and evenly convex, not markedly more rounded at the vertex.

Dimensions of the type, measured in skin :—

Head and body (overstretched, c.) 600 millim. ; tail 410 ; hind foot 108 ; ear 48. (Of another specimen, male, measured by P. O. Simons in the flesh : head and body 559 ; tail 333 ; hind foot 110 ; ear 50.)

Skull : greatest length 94·5 ; basal length 82 ; zygomatic breadth 63 ; nasals, length in middle line 16·5 ; interorbital breadth 18 ; tip to tip of postorbital processes 49 ; postorbital constriction 30·5 ; breadth of brain-case on frontals 38 ; ditto across parietals 43 ; palate length 35 ; length of bulla 20·5 ; length of  $p^1$  11.

*Hab.* of type. Beltran, Jalisco, Mexico. Other specimens from Tatamales, Sinaloa (*Simons*), and N. Yucatan (*Gaumer*).

*Type.* Female. B.M. no. 90.1.4.1. Collected 25th April, 1889, by W. Lloyd, and presented by F. D. Godman and O. Salvin.

This grey Mexican representative of the *F. Wiedii* group contrasts markedly in colour with the tawny forms found to the south of it from Costa Rica to S. Brazil.

I can find no tenable name applicable to this species, that of *F. mexicana*, de Sauss., being antedated several times over in other groups of the genus. Its earliest use appears to have been by Kerr in 1792, who applied it to an ocelot.

In Group III. the following is a description of two fresh specimens apparently assignable to the little-known *F. pardinoides*, Gray, to which Hensel's "*F. guigna*, Mol.," should also be referred :—

Size comparatively small. Fur rather harsh and close. General colour dark, owing both to the dark tone of the ground-colour and the closeness of the spotting. Ground-colour along dorsal area light fulvous, becoming markedly lighter on the sides and white on the belly. Face with the usual white supraorbital line, interrupted black frontal lines, and the two black lines running back on the cheeks to below the ear. Back of ears black, with the usual whitish patch small but well defined. Top of neck with an indistinct black median line, outside which there are two pairs of strong clearly defined black lines, and a third less defined one on the level of the outer base of the ear. The narrow central

black lines are continued interruptedly down the back on to the rump, but laterally and on the shoulders the lines change into rosettes, which are about an inch in diameter, with dark fulvous centres. Then below on the belly and on the limbs the rosettes again pass into black spots. Chin, chest, and groins white, with but little spotting; belly heavily spotted. Limbs dull yellowish fulvous, the spots getting smaller terminally, being only about  $\frac{1}{4}$  inch in diameter on the metapodials and disappearing on the digits. Tail rather short, with 11 to 13 black rings, which are slightly broader than the light spaces between them.

Skull small and delicate, very smooth, and without any trace of ridges or crests, with the usual exception of the lambdoid crest, and even this is low and little developed. Face short. Nasal region pinched in, but not markedly convex above, the profile running in an even scarcely convex line to the vertex. Postorbital processes small and weak, the brain-case but little constricted behind them. Bullæ high and well inflated.

Dimensions of the male, measured in the flesh:—

Head and body 500 millim.; tail 255; hind foot 105; ear 38.

Skull: greatest length 83; basal length 71.5; zygomatic breadth 49.5; nasals, length in middle line 16.5; greatest breadth 11.6; middle breadth 5.2; interorbital breadth 14.2; tip to tip of postorbital processes 32; intertemporal breadth 25; length of brain-case from between postorbital processes 51; breadth of brain-case 39; palate length 31; length of bulla 17; length of upper incisive row 10; length of  $p^1$  on outer edge 9.6, of  $m_1$  8.

*Hab.* Espiritu Santo. Coll. A. Robert.

Compared with this, the Central-American representative of the group may be distinguished as follows:—

*Felis pardinoides oncilla*, subsp. n.

Size and general characters as in true *F. pardinoides*. Fur of about the same length, and similarly directed backwards on the nape, but much softer and richer throughout. Ground-colour much richer and deeper, and scarcely lightening on the sides or limbs; it is something near Ridgway's clay-colour, but darker and glossier. Black lines of head and nape very strong, but the indistinct median dark nuchal line not present. Posterior back with a strong central black line, outside which rosettes begin to form at once. Lateral rosettes but little elongated, their centres much darker than

the general ground-colour. Under surface brownish clay-colour, dull whitish on the chin; chest and groins scarcely lighter at all, instead of the white of true *pardinoides*. Hands and feet dull brownish clay-colour, some fine spots present on the metapodials. Tail much blacker above than in the southern form, the black rings very broad, and the light ones (of which about 8 or 9 may be counted) very narrow; below, on the other hand, it is clay-colour for three fourths its length, with indistinct black annulations, the tip broadly black-ringed.

Dimensions of the type, measured in skin:—

Head and body 505 millim.; tail 290; hind foot 105; ear 39.

*Hab.* Volcan de Irazu, Costa Rica.

*Type.* B.M. no. 78. 7. 6. 3. Collected by Mr. Rogers and presented by F. DuCane Godman, Esq.

The skull of this cat is unfortunately lost, but as its relationship to *F. pardinoides* is quite clear, I nevertheless venture to describe it. It differs from that animal by its much darker and richer general colour, especially its darker underside and darker limbs, its softer fur, and the great breadth of the black bands of the upper surface of its tail.

*Felis pardinoides andina*, subsp. n.

Intermediate in general colour between *F. p. oncilla* and the typical *pardinoides*, the upper surface and limbs more as in the former, though slightly lighter, the under surface with the white chin, throat, chest, and groins of true *pardinoides*. Fur quite soft, markedly softer and richer than in *pardinoides*. Tail coloured about as in *pardinoides*, not with the broad black bands of *oncilla*.

Skull decidedly larger than in *pardinoides*; nasals longer; frontal region broader; mesopterygoid fossa longer, mainly owing to the palate ending rather further forward, almost level with the back of the molar; bullæ comparatively small. Teeth, especially carnassials, large and heavy.

Dimensions of the type, measured in skin:—

Head and body 520 millim.; tail 290; hind foot 109; ear 41.

Skull: greatest length 86; basal length 73.5; zygomatic breadth 53.5; length of nasals 18; interorbital breadth 14; tip to tip of postorbital processes 36; postorbital constriction 28; breadth of brain-case 41; palate length 30; outside length of  $p^4$  10.7.

*Type.* (Apparently) male. B.M. no. 77. 4. 3. 4. Collected by Mr. Clarence Buckley.

*Hab.* Jima, Province of Azuay, Ecuador. Altitude 2400 metres.

This Andean form of the group may be distinguished from *pardinoides* by its softer fur and larger skull, and from *oncilla* by its lighter underside and light narrowly ringed tail.

*Felis salinarum*, sp. n.

Generally similar to *F. Geoffroyi*, but much smaller.

Fur thin and shaggy. Hairs of nape not reversed. General colour sandy buff. Spots very numerous, quite small, not connected into lines, except on the nape. Cheek-lines narrow and inconspicuous. Ears large, the white patch on their backs large, and extending downwards to their outer base. Nape with two narrow continuous black lines on each side of the middle line, and two more interrupted and less well-marked lines outside them. Chin white; throat buffy; chest and groins white, belly sandy; a black line across the interramia, another on the throat, and a number of black spots, larger than those on the upper surface, on the belly. Limbs sandy on their outer, whiter on their inner surfaces, strongly banded proximally, the spots dying away on the metapodials. Tail sandy, irregularly marked above only proximally, ringed terminally.

Skull scarcely exceeding in length that of *F. oncilla*, consequently much smaller than that of *F. Geoffroyi*. Post-orbital processes well developed. Brain-case broadly rounded, but more contracted anteriorly than in the *F. Wiedii* group.

Dimensions of the type, measured in the flesh:—

Head and body 435 millim.; tail 265; hind foot 97; ear 37.

Skull: greatest length 84·5; basal length 71; zygomatic breadth 56·5; length of nasals in middle line 17; inter-orbital breadth 15·5; tip to tip of postorbital processes 38; postorbital constriction 26·5; breadth of brain-case 41·5; palate length 32; length of upper incisive row 10; length of  $p^4$  on outer edge 10·7.

*Hab.* of type. Cruz del Eje, Central Cordova. Alt. 600 m.

*Type.* Female. B.M. no. 2. 2. 5. 10. Original number 1713. Collected 28th November, 1901, by the late P. O. Simons. One specimen.

This is a small northern representative of *F. Geoffroyi*, and was rightly distinguished as such by Dr. Matschie\*,

\* SB. Ges. nat. Fr. Berlin (1894), p. 59.

who records examples from Jujuy and Tucuman, using for it the name of *F. guigna*, Mol. But Molina's animal, first described from "Chili," was afterwards identified by Philippi\* with a cat from Valdivia, in the southern part of that country, which may therefore be taken as its type locality. Now it is inconceivable that, while on the eastern side of the Andes a northern and a southern form are found, separated at about lat. 32° S., the Valdivian one, at nearly 40° S., should be the same as the *northern* one of the two eastern forms. On the other hand, it is by no means unlikely that *F. guigna* and *F. Geoffroyi* will prove to be the same, as in the south the Andes do not present the same faunistic barrier that they do further north.

*Hapale flaviceps*, sp. n.

General characters of *H. penicillata*, with which it shares the size, grizzled body-colour, with its tricolor fur, the suppressed banding of the back, the distinct ringing of the tail, and the whitish or yellowish hands and feet. But the whole of the head is buffy yellow, rather whiter on the muzzle, and the preauricular tufts are practically absent, being replaced by long tufts of yellowish-white hairs situated on the inner aspect of the ear-conch. Throat yellowish. Middle line of belly and anal region black.

Dimensions of the type (measured in the flesh):—

Head and body 248 millim.; tail 298; hind foot 65; ear 23.

*Hab.* Engenheiro Reeve, Espiritu Santo.

*Type.* Female. Original number 1220. Collected 11th February, 1903, by Alphonse Robert. Three specimens.

*Oryzomys sublineatus*, sp. n.

A northern representative of *O. dorsalis*, Hensel, with harsher fur, broader skull, and concave anterior zygoma-root.

Size about as in *O. dorsalis*, or rather larger; tail shorter in proportion. Fur comparatively harsh and short; hairs of back about 8 millim. in length. General colour above dull grizzled greyish or "bistre," coarsely lined with buffy. An indistinct blackish line along the posterior half of the spine. Cheeks and sides slightly more buffy than the back. Under surface short-haired, dull buffy whitish, not very sharply defined on the sides; bases of hairs slaty. Ears

\* Arch. f. Nat. xxxix. p. 8 (1873).

short, finely haired, brown. Outer sides of arms and legs greyish, inner sides whitish; hands and feet wholly white. Tail rather short for this group, finely haired and scaled, greyish brown above, rather whiter below.

Skull broad and flattened, with widely expanded zygomata. Interorbital region smoothly rounded laterally, flattened above, without any trace of ridges; anterior edge of zygomatic plate concave, with a projecting point above, an unusual structure in this group; palatal foramina large and widely open, not reaching back to the level of  $m^1$ ; back of palate level with the hinder edge of  $m^3$ .

Dimensions of the type, measured in the flesh:—

Head and body 140 millim.; tail 111; hind foot, s. u. 27, c. u. 29; ear 19.

Skull: tip of nasals to back of frontals 23; zygomatic breadth 18; length of nasals 13; interorbital breadth 5.1; palate length 14.2; diastema 9.2; palatal foramina  $7.2 \times 3.1$ ; length of upper molar series (much worn) 4.8.

*Hab.* Engenheiro Reeve, Inland of Victoria, Prov. Espirito Santo, Brazil. Alt. 500 m.

*Type.* Old male. Original number 1224. Collected 14th February, 1903, by Mr. Alphonse Robert. One specimen.

This coarse-haired *Oryzomys* is allied to the *O. dorsalis* of Rio Grande do Sul, to which it shows its affinity by its dark dorsal line and smooth interorbital region, but from which it differs by the details above mentioned.

#### *Akodon suffusus*, sp. n.

Closely allied to *A. hirtus*, Thos., but the general colour stronger, the belly lighter, and with certain cranial differences detailed below.

Fur close, soft, and thick, about 11 millim. long on the back. General colour of the dorsal area grizzled olivaceous yellow (rather darker than Ridgway's "tawny olive"), this colour running forwards on to the crown, but passing on the cheeks and sides into cinereous grey. Under surface whitish, lighter and more sharply defined than in *A. hirtus*; the bases of the hairs slaty as usual. Ears short, well-haired, brown, an inconspicuous whitish spot at their bases. Hands and feet white. Tail well-haired, sharply bicolor, dark brown above, white below.

Skull in general shape like that of *A. hirtus*, not elongated as in *A. longipilis*. But it is rather lower and flatter throughout, less rounded and convex along the middle line, especially in the interorbital region. Anteorbital plate narrow (width 1.7 millim. as against 2.1). Palatal foramina



comparatively short. Hinder edge of palate some distance behind last molar. Molars small and light.

Dimensions of the type, measured in the flesh:—

Head and body 110 millim.; tail 77; hind foot, s. u. 22, c. u. 24; ear 14.

Skull: greatest length 27·5; basilar length 21·3; greatest breadth 14; nasals 11; interorbital breadth 4·8; breadth of brain-case 12·2; palate length 11·2; diastema 7; palatal foramina 6·1; length of upper molar series 3·4.

*Hab.* Valle del Lago Blanco, Southern Chubut (Cordillera region).

*Type.* Male. Original number XVI. Collected 6th August, 1900, by Mr. J. Koslowsky. About forty specimens examined.

*Akodon* (*Chelemys*, subg. n.) *vestitus*, sp. n.

[CHELEMYS\*, subg. n.]

General characters, skull, and dentition as in *Akodon*, but the claws, especially the anterior ones, very large, fossorial.

Type, *Akodon megalonyx*, Waterh.

Now that the known species have been so considerably multiplied, it seems convenient to have a subgeneric name by which to designate what have been hitherto termed the "long-clawed *Akodons*."]

General appearance and proportions very much as in *A. (C.) macronyx*, Thos., but colour darker, tail more distinctly bicolor, and skull broader and flatter.

Fur very long, close, and woolly; hairs of back about 10–11 millim. in length. General colour above darker than in *A. macronyx*, approximately resembling Ridgway's "sepia" or "olive." Sides paler, approaching "broccoli-brown." Underparts dull white, well defined on the sides for such a thick-furred animal, the slaty bases to the hairs showing through. Ears short, scarcely projecting above the fur, well-haired, brown. Arms and inner sides of legs greyish white; hands and feet wholly white. Tail well-haired, distinctly and sharply bicolor, dark brown above, white below.

Skull, as compared with that of *A. macronyx*, broader, more flattened, and less cylindrical, with more widely expanded zygomata; interparietal rather smaller. Teeth as in the allied species.

\*  $\chi\eta\lambda\acute{\eta}$ , a hoof or claw.

Dimensions of the type, measured in the flesh:—

Head and body 127 millim.; tail 57; hind foot, s. u. 23, c. u. 25; ear 15.

Skull: greatest length 30; basilar length 24.4; zygomatic breadth 17; nasals 11.1; interorbital breadth 4.7; breadth of brain-case 14; palate length 12.8; diastema 7.8; palatal foramina 7; length of upper molar series 5.3.

*Hab.* Valle del Lago Blanco, Cordillera region of Southern Chubut Territory, Patagonia.

*Type.* Male. Original number I. Collected 28th September, 1900, by Mr. J. Koslowsky. Ten specimens examined.

This species is the southern representative of *A. macronyx*, Thos., to which it is no doubt very nearly allied; but the fresh series now available indicates that it should have a name of its own.

In company with the series of *A. vestitus* there are two examples of the other long-clawed southern group *Notiomys*, distinguishable by its very small and comparatively brachyodont molars from the more or less hypsodont *Akodon*, but I cannot definitely determine their species. From the descriptions given it seems not impossible that both "*Hesperomys (Akodon) Michaelsoni*," Matschie, and "*Oxymycterus microtis*," Allen, belong to *Notiomys*, as their long claws, short tails, and very small molars agree precisely with what is found in that group.

#### *Ctenomys Azaræ*, Thos.

*Ctenomys Azaræ*, Thos. Ann. & Mag. N. H. (7) xi. p. 228 (1903).

The locality of this animal proves unfortunately to have been wrongly given in the above description.

The specimens were presented to the British Museum by Señor Maximo Hopff, of Buenos Ayres, who handed them to the British Consulate there for transmission home. It happened, however, that a collection of Mr. W. Foster's was coming home by the same intermediary, and Mr. Hopff's specimens, which were not labelled, got placed with the latter and were considered to be part of it.

Now, however, enquiry shows that the specimens were obtained in the Province of Buenos Ayres, on the central pampas, lat. 37° 45' S., long. 65° W., 780 kilometres south-west of the capital, a region from which no examples of *Ctenomys* had previously been recorded.